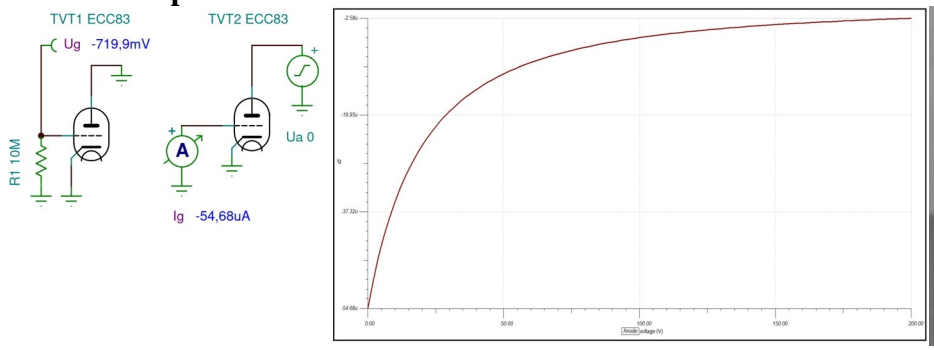
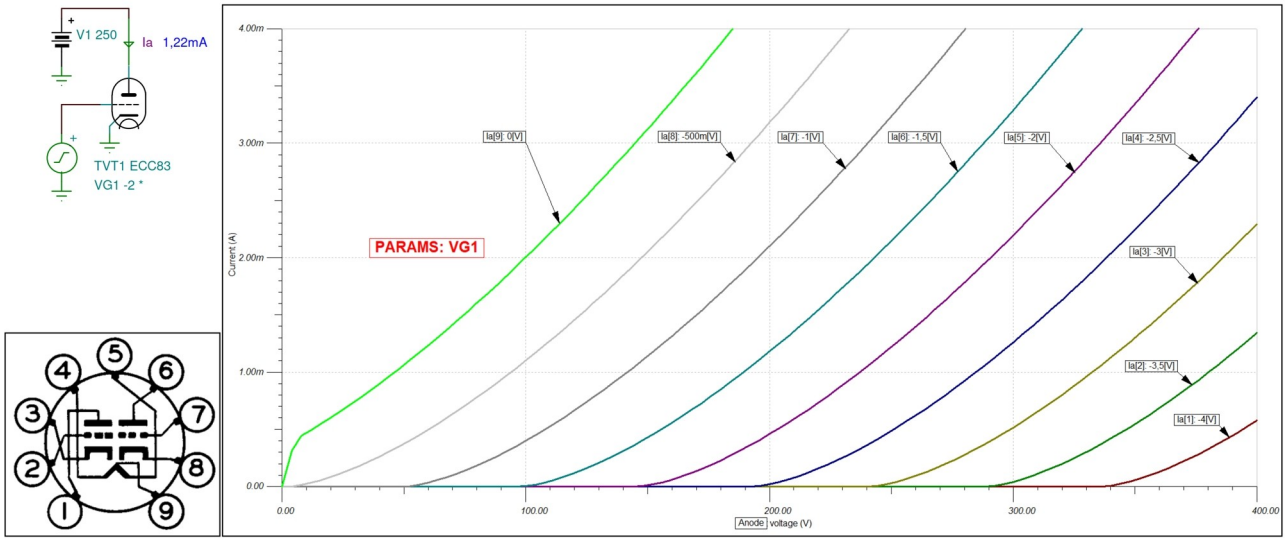
ECC83 (12XA7) High μ Double Triode SPICE Macro Model

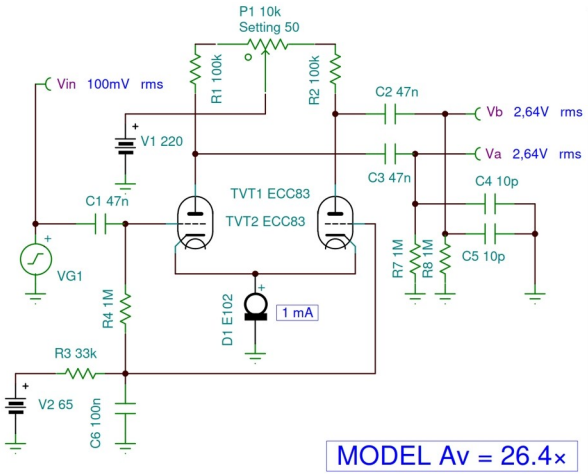
Grid Diode Splash Current

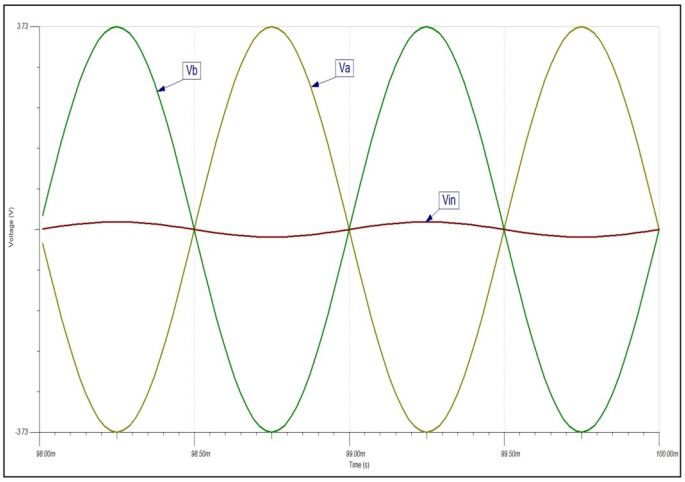


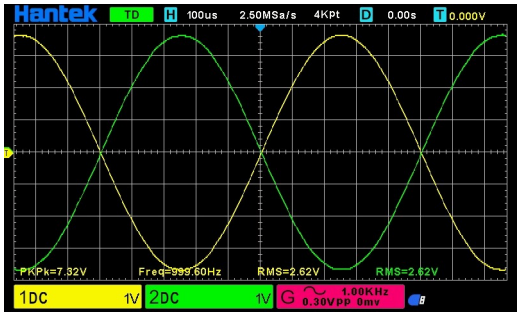
Output Characteristics



Common-Cathode Phase Splitter Using a Current-Limiting Diode







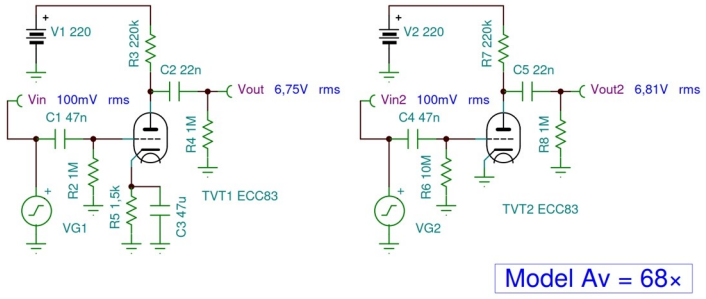
Real Tube Av = 26.2×

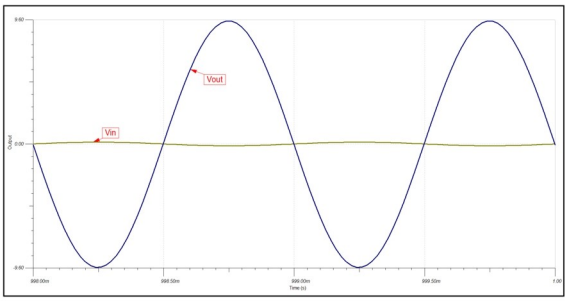
The model provides good accuracy for both DC operating points and AC gain. A common-cathode phase splitter using a current-limiting diode exhibits significantly improved output symmetry compared to a traditional resistor-biased configuration.

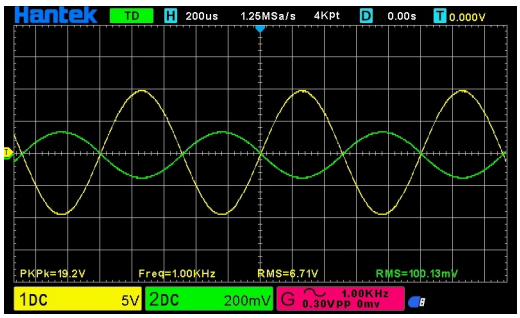
Replacing the cathode resistor with a CLD stabilizes the operating current, resulting in more balanced waveform amplitudes at the two outputs.

V2, R3, and C1 may be omitted when a DC-coupled preamplifier is used. In this configuration, the grid of the first triode is connected directly to the preamplifier's anode, which is biased at 65 V DC.

Audio Voltage Amplifiers







Real Tube Av = 67×

The DC operating point of the second amplifier stage is determined by the high-value grid resistor (10 MΩ) and the negative voltage generated by the grid current. In this circuit, the gain is slightly higher than it would be if the operating point were set by a cathode resistor, although the distortion is also slightly increased. The values predicted by the model and those measured on the actual vacuum tube are practically identical (68× calculated gain and 67× measured gain).

Zabb Csaba